FEDERAL - STATE - PRIVATE
COOPERATIVE SNOW SURVEYS

WATER SUPPLY OUTLOOK FOR WASHINGTON

Prepared by

U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, and other Federal, State and Private organizations.

AS OF
MAY 1, 1971

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbis Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters of key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80202
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 970, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82601

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia

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WATER SUPPLY OUTLOOK
FOR
WASHINGTON

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

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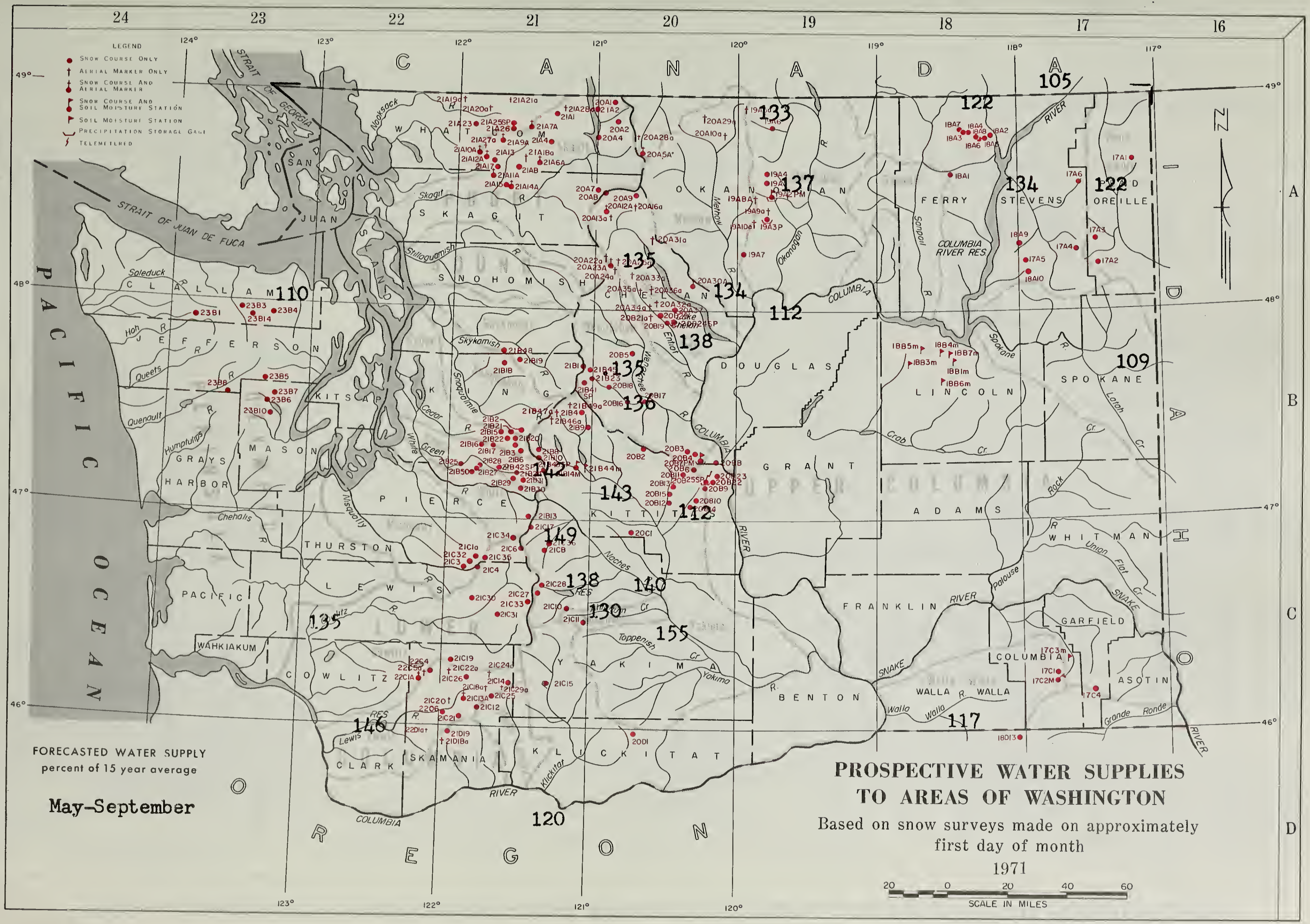

PROSPECTIVE WATER SUPPLIES TO AREAS OF WASHINGTON

Based on snow surveys made on approximately first day of month

1971

FORECASTED WATER SUPPLY
percent of 15 year average

May–September

INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

UPPER COLUMBIA DRAINAGE

Pend Oreille River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Boyer Mountain	17A2	7	31N	43E	5250
Bunchgrass Meadow	[illegible]	24	37N	44E	5000
Winchester Creek	17A3	30	[illegible]	43E	2970

Kettle River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Boulder Road	18A2	36	39N	36E	1450
Butte Creek	18A3	28	39N	35E	4070
Cabin Creek	18A8	5	38N	36E	3170
Goat Creek	18A4	26	39N	35E	3595
Snow Caps Creek	18A5	3	38N	36E	2150
Snow Caps Trail	18A6	5	38N	36E	2720
Summit G. S.	18A7	20	39N	35E	4600

Colville River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Baird	17A6	19	36N	42E	3215
Carlson	18A9	34	32N	38E	2885
Chewelah	17A4	11	32N	41E	4925
Stranger Mountain	17A5	26	31N	38E	4990
Togo	18A10	6	29N	38E	3370

Sanpoil River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Sherman Creek Pass	18A1	19	36N	35E	5350

Okanogan River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Clark	19A8a	2	36N	23E	7000
Muckamuck	19A9a	20	36N	24E	6750
Mutton Creek No. 1	19A1	30	37N	24E	5700
Mutton Creek No. 2	19A4	19	37N	24E	6000
Paysayten	20A28a	32	40N	18E	4300
Rusty Creek	19A3P	18	35N	24E	4000
Salmon Meadows	19A2PM	33	37N	24E	4500
Starvation Mtn.	19A10a	15	35N	23E	6750
Touts Coulee	19A6	30	39N	25E	2845

Methow River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Billy Goat Pass	20A10a	10	38N	20E	6400
Dollar Watch	20A29a	8	39N	20E	7000
Harts Pass	20A5A	7	37N	18E	6500
Horseshoe Basin	19A5a	15	40N	23E	7000
Loup Loup	19A7	36	34N	23E	4650

Chelan Lake Basin

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Cloudy Pass	20A22a	12	31N	15E	6500
Greenwood Flat	20A25a	3	31N	16E	3540
Little Meadows	20A24a	8	31N	16E	5275
Lyman Lake	20A23a	18	31N	16E	5900
Park Creek Flat	20A13a	18	34N	16E	2220
Park Creek Ridge	20A12A	7	34N	16E	4600
Petersons	20A16a	3	34N	17E	3730
Rainy Pass	20A9	21	35N	17E	4780
Safety Harbor	20A30A	32	31N	20E	6300
War Creek Pass	20A31a	34	33N	18E	6500

Entiat River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Brief	20B19	34	28N	19E	1600
Entiat Meadows	20A33a	28	31N	17E	4800
Entiat River Trail	20A34a	2	29N	17E	3150
Fox Camp	20A36a	17	30N	18E	6510
Pope Ridge	20B20	22	29N	18E	4300
Pope Ridge Snow Pillow	20B24SP	22	29N	18E	4300
Pugh Ridge	20A32a	34	30N	18E	6400
Shady Pass	20A37	20	29N	19E	6200
Snow Brushy	20A35a	21	30N	17E	3850
Tommy Creek	20B21a	10	28N	18E	5300

Wenatchee River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Berne-Mill Creek	21B23	7	26N	15E	2925
Berne-Mill Creek (New)	21B41SP	13	26N	14E	3240
Blewett Pass No. 2	20B2	35	22N	17E	4270
Chiwaukum G. S.	20B16	4	25N	17E	1810
Lake Wenatchee	20B5	33	27N	17E	1970
Leavenworth R. S.	20B17	1	24N	17E	1127
Merritt	20B18	4	26N	16E	2140
Stevens Pass	21B1	14	26N	13E	4070
Stevens Pass Sand Shed	21B45	12	26N	19E	3700
Trough #2	20B25SP	10	20N	20E	5310

Clockum Creek

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Colockum Creek	20B22	11	20N	20E	5300
Colockum Creek #2	20B23	1	20N	20E	4300

Squilchuck Creek

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Beehive Springs	20B3	[illegible]	21N	19E	4400
Scout-A-Vista	20B4	18	21N	20E	3400

Stemilt Creek

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Jump-Off	20B8	34	21N	20E	4450
Stemilt Slide	20B6	30	21N	20E	5000
Upper Wheeler	20B7PM	30	21N	20E	4400

Crab Creek

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Creston-Kunz	18B1m	32	27N	34E	2440
Jack Woods	18B3m	28	27N	31E	2750
Krause	18B4m	21	27N	33E	2420
Sheffels	18B5m	17	27N	32E	2378
Sherman	18B7m	24	27N	33E	2440
Wheatridge	18B6m	24	25N	32E	2290

Yakima River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Ahtanum R. S.	21C11	26	12N	14E	3100
Big Boulder Creek	21B9	35	23N	14E	3200
Bumping Lake	21C8	23	16N	12E	3450
Bumping Lake New	21C36	13	16N	12E	3400
Colockum Pass	20B9	25	20N	20E	5370
Cooke Creek	20B10	17	19N	20E	4123
Domery Flat	21B44m	15	20N	14E	2200
Fish Lake	21B4	34	24N	14E	3371
Green Lake	21C10	3	12N	13E	6000
Grouse Camp	20B11	29	21N	19E	5385
High Creek	20B12	34	20N	19E	2930
Joe Lake	21B46a	22	23N	12E	4624
Lake Cle Elum	21B14M	15	20N	14E	2200
Lemah Creek	21B47a	7	23N	13E	3327
Manastash	20C1	24	17N	16E	3935
Morse Lake	21C17	6	16N	11E	5400
Nanum	20B13	4	20N	19E	3875
Trail Creek	20B14	20	19N	20E	3360
Tunnel Avenue	21B8	13	21N	11E	2450
Walters Flat	20B15	22	20N	19E	3360
Waptus Lake	21B49a	12	23N	13E	3024
White Pass (East Side)	21C28	2	13N	11E	4500
White Pass (Leach Lake)	21C27	1	13N	11E	4500

LOWER COLUMBIA DRAINAGE

Asotin Creek

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Spruce Springs	17C4	9	8N	42E	5700

Mill Creek

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Couse	17C3m	2	9N	35E	3370
Homestead	17C1	11	9N	40E	4030
Martin Springs (Helmers SM)	17C2M	23	9N	40E	4400
Walla Walla Diversion	18D13	22	6N	38E	2400

Klickitat River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Satus Pass	20D1	21	6N	17E	4030
West Fork Cabin	21C15	23	9N	12E	3000

White Salmon River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Cultus Creek	21C12	35	7N	8E	4000

Lewis River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Blue Lake	21C22a	19	9N	8E	4800
Bob's Trail	21C21	25	8N	7E	2200
Calamity Ridge	22D1a	8	5N	5E	2500
Council Pass	21C18a	24	9N	9E	4200

Lewis River (continued)

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Divide Meadow	21C29a	21	9N	10E	5600
Grand Meadow	21C25	28	8N	9E	3500
Lone Pine Shelter	21C26	8	9N	7E	3800
Marble Mountain	22C5a	24	8N	5E	3200
New Muddy River	22C6	36	8N	6E	2000
Oldman Pass	21D19	22	6N	7E	3100
Plains of Abraham	22C1a	35	9N	5E	4400
Smith Creek Road	22C4	29	9N	6E	2100
Spencer Meadow	21C20a	16	8N	7E	3400
Surprise Lakes	21C13A	14	7N	8E	4250
Table Mountain	21C24a	20	9N	9E	4200
Timbered Peak	21D18a	36	6N	6E	3000

Cowlitz River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Cayuse Pass	21C6	15	16N	10E	5300
Mosquito Meadows	21C19	33	10N	7E	4100
Ohanapecosh	21C32	28	15N	10E	2200
Packwood Lake	21C31	21	13N	10E	2870
Pigtail Peak	21C33	11	13N	11E	5900
Potato Hill	21C14	36	10N	10E	4500
Willame Creek	21C30	3	13N	8E	3250

PUGET SOUND DRAINAGE

Nisqually River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Ghost Forest	21C4	23	15N	8E	4550
Longmire	21C3	29	15N	8E	2760
Paradise Park (New)	21C35	13	15N	8E	
Stem Glade	21C1	13	15N	8E	5050

White River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Corral Pass	21B13	30	18N	11E	6000
White River Campground	21C34	4	16N	9E	

Green River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Airstrip	21B24	18	20N	11E	1800
Charley Creek	21B25	27	21N	8E	1200
Cougar Mountain	21B42SP	21	21N	9E	3200
Grass Mountain No. 2	21B27	14	20N	8E	2900
Grass Mountain No. 3	21B28	12	20N	8E	2100
Lester Creek	21B29	36	20N	10E	3100
Lynn Lake	21B50	21	20N	8E	4000
Sawmill Ridge	21B31	5	19N	11E	4700
Snowshoe Butte	21B43SP	14	20N	11E	5000
Stampede Pass	21B10	25	21N	11E	3000
Twin Camp	21B30	18	19N	11E	4100

Cedar River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
City Cabin	21B3	10	21N	10E	2390
Mt. Gardner	21B21	30	22N	10E	3300
Mt. Gardner Aux.	21B22	31	22N	10E	2500
Mt. Lindsay	21B16	31	22N	9E	2500
Mt. Washington	21B15	8	22N	9E	3000
Rex River	21B17	11	21N	9E	2400
South Fork Cedar	21B6	24	21N	10E	3000
Tinkham Creek	21B20	1	21N	10E	3400

Snoqualmie River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Alpine Meadow	21B48	31	27N	9E	3500
Olallie Meadows	21B2	19	22N	11E	3625
South Fork Tolt	21B18	26	26N	9E	1900

Skykomish River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Lake Elizabeth	21B19	33	26N	10E	2900

Skagit River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Beaver Creek Trail	21A4	35	39N	12E	2200
Beaver Pass	21A1	9	39N	12E	3680
Brown Top	21A28a	26	40N	12E	6000
Devils Park	20A4	34	38N	16E	5900
Freezeout Creek Trail	20A1	14	40N	14E	3500
Freezeout Meadows	20A2	8	40N	16E	5000
Lake Hozomeen	21A2	19	40N	14E	2600
Meadows Cabins	20A8	29	36N	14E	1900
Thunder Basin	20A7	15	35N	14E	4200

Baker River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Baker Pass	21A27a	1	37N	7E	4900
Dock Butte	21A11A	8	36N	8E	3800
Easy Pass	21A7A	19	39N	11E	5200
Jasper Pass	21A6A	17	38N	11E	5400
Komo Kulshan	21A17	31	37N	9E	800
Marten Lake	21A9A	23	38N	8E	3600
Mount Blum	21A18a	27	38N	10E	5800
Rocky Creek	21A12A	20	37N	8E	2100
Schreibers Meadow	21A10A	18	37N	8E	3400
S. F. Thunder Creek	21A14A	20	36N	9E	2200
Sulphur Creek	21A13	22	37N	8E	1600
Three Mile Creek	21A15	18	36N	9E	1600
Watson Lakes	21A8	25	37N	9E	4500

Nooksack River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Bald Mountain	21A19a	7	40N	7E	4400
Canyon	21A20A	20	40N	8E	5100
Glacier Creek	21A23	9-10	38N	7E	3700
Panorama New	21A26	17	39N	9E	4300
Panorama Snow Pillow	21A25SP	17	39N	9E	4300
Twin Lakes	21A21a	16	40N	9E	5200

OLYMPIC PENINSULA

Dungeness River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Deer Park	23B4	1	28N	5W	5200

Morse Creek

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Cox Valley	23B14	29	28N	6W	

Elwha River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Hurricane	23B3	36	29N	7W	4500

Skokomish River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Black and White	23B7	17	24N	5W	4200
Black and White Lakes	23B6	16	24N	5W	4700
Four Stream	23B10	1	23N	6W	3000
Home Sweet Home	23B5	28	25N	5W	5200
Sundown Pass	23B8	25	24N	7W	3900

Soleduck River

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Deer Lake	23B1	14	28N	9W	3900

LEGEND

NUMBERING SYSTEM EXAMPLE

21A7	Snow Course Only
21A7a	Aerial Marker Only
21A7A	Snow Course and Aerial Marker
21A7M	Snow Course and Soil Moisture Station
21A7m	Soil Moisture Station
21A7P	Snow Course and Precipitation Storage Gage
21A7p	Precipitation Storage Gage
21A7SP	Snow Pillow

WATER SUPPLY OUTLOOK

State of Washington
May 1, 1971

If the weather continues to give us alternate warm and cool spells the runoff in the state of Washington and from the tributary basins to the Colubmia River should cause no excessive problems this year. The cool weather during the month of April retarded snow melt and resulted in an increase, percentagewise, of the snowpack and in many cases even a build up of the water equivalent in the snowpack. The recent hot spell caused some rivers to reach a bank-full condition but this was followed by a cooling trend which permitted much of this runoff to slacken off and give the residents of the state some respite. If, on the other hand, it turns warm and stays that way and, also, if precipitation develops that is above normal, a situation similar to the 1948 high water could very well occur. The snow is still in the mountains and it still has to come out. The rate in which it comes out is totally dependent on subsequent weather conditions. The water supply picture for the state is good in all respects and all areas. There will be no isolated spots that should feel a water shortage during the 1971 irrigation season. Reservoirs are all down but this is done purposely to control expected high flows that are yet to come. Many of the reservoirs are being pulled at this time in anticipation of the above-normal spring melt runoff. The precipitation picture over the state, so far, shows that only in the northeastern portion of the state was there above-normal rainfall during April and the northeast drainage division was the only one that had rainfall that was more than 20% above normal.

Streamflows during the month were generally near normal with the Chehalis and the Yakima Rivers flowing in excess of 40% above normal and the Klickitat and the Columbia at The Dalles flowing near 20% above normal.

SNOW COVER

A snow cover map is not prepared on the first of May because during normal years many of the snow courses at the lower elevations are reported to have no snow and then on years such as this the snow cover is present at these snow courses which gives a highly biased snow-water picture. In order to somewhat reduce this condition any snow course that had a snow cover greater than 200% was recorded as 200% of normal. Many of the snow courses measured in the state reached this point as of May 1. Even with this innovation this month the snow cover improved, percentagewise, over that which was reported last month. Only in isolated watersheds such

as the Kettle, Ahtanum, Green, and Skykomish was there a reduction in the snow cover percentage figures. This, also, was a result of fewer snow courses being measured in these watersheds than are measured on April 1. The snow cover now ranges from a low of 25% above normal for the Kettle River to a high of 83% above for the Snoqualmie River. In areas such as the Lewis River the low-elevation snow cover is as good or better than that occurring at the upper elevations while over the rest of the state there has been some melting at lower elevations but not to the extent as could normally be expected.

RESERVOIRS

Of all the reservoirs reported for the state of Washington only Banks Lake and the three reservoirs on the Skagit River have more than normal amounts of water in storage as of May 1. All other reservoirs that are used for power have been reduced to handle the expected high flows later in the runoff period; or, in the case of the small reservoirs in the Okanogan drainage, the carry-over was so low last year that these reservoirs are just trying to fill to satisfy the needs of water users. It is anticipated that all reservoirs will fill with the spring runoff and that a good carry-over can be expected into 1972.

PRECIPITATION

A review of the precipitation picture shows that below-normal rainfall occurred in the Columbia portion of the basin, in central Washington and in the central and northcentral portions of the state during the September and October period of last year. During the winter months of November through March there was a reversal with below-normal precipitation occurring only along the eastern boundary of the state. So far this spring the northeastern region of the state is the only area that received above-normal rainfall with all other areas reporting deficient precipitation--the lowest occurring in the central area which was 45% below normal.

STREAMFLOW

The runoff during April was similar to that which plagued us early this winter. The Similkameen River again had much below-normal runoff with the Okanogan being assisted by releases from Okanogan Lake. The Wenatchee and Chelans again had poor runoff while the Yakima experienced near normal flows. Along the main stem flows from Canada were 5% above normal and increased going down stream until The Dalles had a flow that was 16% above normal. Reports have reached us that the first five days in May, as a result of the high temperature regime over the total northwest, resulted in very high flows in all tributary streams but this was reduced by

a cooling trend which followed. Forecasts of streamflows range from 5% above normal for the Columbia River at Birchbank to a high of 55% above normal for the Yakima at Parker. These are for the May-September runoff period. Numerical forecasts are found following this narrative.

STREAMFLOW FORECASTS - MAY 1971

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts. Streamflow figures for 1970 are preliminary and subject to revision.

			Seasonal Streamflow in Thousands of Acre-Feet				
Basin, Stream and Station	Forecast Runoff 1971	% 15-Yr Avg.	Fore-cast Period	1970	1969	1968	15-Yr Average 1953-67
COLUMBIA BASIN							
Columbia River System							
Columbia River at Birchbank 1/	45750	105	May-Sep	32981	44842	45987	43577
	39950	106	May-Jul	26324	35647	35293	37692
	25450	105	May-Jun	19376	27310	23482	24252
Columbia River at Grand Coulee 1/	70300	112	May-Sep	50757	62362	59748	62799
	58500	112	May-Jul	42646	53372	47649	52240
	44700	114	May-Jun	33631	42279	34147	39230
Columbia River bl Rock Island Dam 1/	77200	112	May-Sep	54688	67499	65842	68964
	63800	111	May-Jul	46321	58282	52947	57500
	48700	113	May-Jun	36747	46531	37870	43110
Columbia River at The Dalles, OR 1/	110900	120	May-Sep	79613	87847	81386	92456
	92800	120	May-Jul	67678	75516	64872	77330
	72200	121	May-Jun	54808	61607	47877	59690
Pend Oreille River System							
Pend Oreille River bl. Box Canyon	16900	122	May-Sep	13191	12406	11500	13863
	15400	122	May-Jul	12224	11294	9708	12644
	13050	123	May-Jun	10584	9272	8102	10619
Kettle River System							
Kettle River nr. Laurier	2030	122	May-Sep	1028	1747	1696	1667
	1920	122	May-Jul	997	1696	1565	1571
	1710	123	May-Jun	932	1556	1405	1393

1/ Observed flow corrected for storage in any of the following reservoirs which are above the station: Kootenay Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee, Noxon Reservoir and pumpage at F. D. Roosevelt Lake.

Streamflow Forecasts - May 1971 (Cont.)

Basin, Stream and Station	Forecast Runoff 1971	% 15-Yr. Avg.	Seasonal Streamflow in Thousands of Acre-Feet				
			Fore-cast Period	1970	1969	1968	15-Yr Average 1953-67
Kettle River System (Cont.)							
Colville River							
at Kettle Falls	131	134	May-Sep	63	141	42	98
	115	134	May-Jul	54	127	33	86
	101	133	May-Jun	49	111	29	76
Spokane River System*							
Spokane River							
at Post Falls ID 2/	2300	109	May-Sep	2254	1952	1228	2120
	2200	109	May-Jul	2162	1862	1080	2025
	2070	110	May-Jun	2019	1749	985	1882
Okanogan River System **							
Similkameen River							
nr. Nighthawk	1900	133	May-Sep	830	1116	1377	1431
	1780	134	May-Jul	789	1067	1287	1325
	1490	135	May-Jun	720	969	1086	1103
Okanogan River							
nr. Tonasket	2200	137	May-Sep	869	1296	1486	1609
	1980	137	May-Jul	810	1201	1348	1449
	1650	139	May-Jun	731	1079	1122	1190
Methow River System **							
Methow River							
nr. Pateros	1300	134	May-Sep	593	942	900	969
	1200	135	May-Jul	557	896	833	895
	1020	136	May-Jun	503	830	694	748
Chelan River System							
Chelan River							
at Chelan 3/	1580	138	May-Sep	850	1188	1149	1148
	1390	139	May-Jul	764	1080	993	1001
	1050	140	May-Jun	632	943	722	752
Stehekin River							
at Stehekin	1120	135	May-Sep		868	815	827
	945	136	May-Jul		760	682	695
	702	138	May-Jun		654	482	509
Wenatchee River System							
Wenatchee River							
at Plain	1600	135	May-Sep	930	1269	1050	1183
	1420	135	May-Jul	852	1176	914	1053
	1100	137	May-Jun	715	1044	698	802

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* Forecasts made by Morland W. Nelson and J. Alden Wilson, Soil Conservation Service, Boise, Idaho.

** These forecasts are based in part upon base flow data especially prepared and furnished for this purpose by the U. S. Geological Survey.

2/ Observed flow corrected for storage in Couer d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie Canals.

3/ Observed flow corrected for storage in Lake Chelan.

Streamflow Forecasts - May 1971 (Cont.)

Basin, Stream and Station	Forecast Runoff 1971	% 15-Yr Avg.	Seasonal Streamflow in Thousands of Acre-Feet				
			Fore-cast Period	1970	1969	1968	15-Yr. Average 1953-67
Wenatchee River System							
Wenatchee River at Peshastin	2180	136	May-Sep	1293	1706	1381	1606
	1980	137	May-Jul	1195	1593	1210	1444
	1530	138	May-Jun	1009	1422	915	1108
Stemilt Basin nr. Wenatchee	140*	--	May-Sep		145*	140*	--
Yakima River System							
Yakima River nr. Martin 4/	168	142	May-Sep	105	128	80	118
	154	144	May-Jul	98	116	62	107
	128	146	May-Jun	89	108	56	88
Yakima River at Cle Elum 5/	1130	143	May-Sep		856	592	790
	1030	145	May-Jul		782	486	707
	858	147	May-Jun		717	403	584
Yakima River nr. Parker 6/	2025	155	May-Sep		1468	779	1308
	2020	156	May-Jul		1483	683	1292
	1810	157	May-Jun		1458	646	1153
Kachess River nr. Easton 7/	148	145	May-Sep	91	111	62	102
	139	146	May-Jul	88	106	52	95
	119	147	May-Jun	83	99	48	81
Cle Elum River nr. Roslyn 8/	580	140	May-Sep	379	422	321	415
	530	141	May-Jul	346	399	274	375
	435	144	May-Jun	295	366	227	303
Bumping River nr. Nile 9/	198	149	May-Sep	119	133	94	133
	182	150	May-Jul	111	125	82	121
	146	151	May-Jun	97	116	62	97
American River nr. Nile	160	143	May-Sep	119	121	88	112
	148	144	May-Jul	111	114	78	103
	120	145	May-Jun	97	104	67	83

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* Thousands of Miners' Inches

4/ Observed flow corrected for storage in Lake Keechelus

5/ Observed flow corrected for storage in Keechelus, Kachess and Cle Elum Lakes and diversion by Kittitas Canal.

6/ Observed flow corrected for storage in Keechelus, Kachess, Cle Elum, Bumping and Rimrock Lakes and diversions by Roza, Union Gap, New Reservation, Old Reservation and Sunnyside Canals.

7/ Observed flow corrected for storage in Lake Kachess.

8/ Observed flow corrected for storage in Lake Cle Elum.

9/ Observed flow corrected for storage in Bumping Lake.

Streamflow Forecasts - May 1971 (Cont.)

Basin, Stream and Station	Forecast Runoff 1971	% 15-Yr Avg.	Seasonal Streamflow in Thousands of Acre-Feet				
			Fore-cast Period	1970	1969	1968	15-Yr. Average 1953-67
Yakima River System (Cont.)							
Tieton River							
at Tieton Dam 10/	298	138	May-Sep	220	233	149	216
	248	137	May-Jul	186	203	116	181
	192	139	May-Jun	150	180	93	138
Naches River							
nr. Naches 11/	1047	140	May-Sep		820	512	748
	942	141	May-Jul		752	430	668
	782	143	May-Jun		683	357	547
Ahtanum Creeks							
nr. Tampico 12/	52	130	May-Sep		44	26	40
	46	131	May-Jul		40	22	35
	40	133	May-Jun		37	19	30
Lower Columbia River System							
Mill Creek							
nr. Walla Walla	21	117	May-Sep		19	10	18
	17	121	May-Jul		15	7	14
	14	117	May-Jun		13	5	12
Lewis River							
at Ariel 13/	1400	146	May-Sep	595	1164	908	956
	1180	148	May-Jul	501	982	630	796
	985	150	May-Jun	429	854	533	657
Cowlitz River							
at Castle Rock 14/	2860	135	May-Sep	1577	2290	1896	2120
	2450	137	May-Jul	1332	1966	1365	1789
	1965	138	May-Jun	1112	1684	1144	1426
			OLYMPIC PENINSULA				
Dungeness River System							
Dungeness River							
nr. Sequim	169	110	May-Sep		172	121	153
	136	111	May-Jul		144	93	122
	100	116	May-Jun		116	65	86

10/ Observed flow corrected for storage in Rimrock Lake.

11/ Observed flow corrected for storage in Bumping and Rimrock Lakes and diversions by Tieton, Selah Valley, Wapatox Canals and City of Yakima.

12/ Observed flow of North and South Forks (combined).

13/ Observed flow corrected for storage in Lake Merwin, Yale and Swift Reservoirs.

14/ Observed flow corrected for storage in Mayfield Reservoir.

COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about May 1, 1971, as per cent of the same date in 1970 and 1969 and average of record.

Tributary Basin	No. of Courses Average	Years of Record	1971 Snow Water Expressed as per cent of 1970	1969	1953-67
		UPPER COLUMBIA BASIN			
Pend Oreille	10 - 14	7 - 34	118	129	136*
Kettle	9 - 10	8 - 33	122	132	125*
Spokane	5	7 - 34	131	141	133*
Okanogan	20 - 22	6 - 36	132	152	142*
Methow	4	10 - 29	132	144	160*
Chelan	1 - 2	10 - 39	166	124	133*
Entiat	8	4 - 6	177	155	--
Wenatchee	4 - 7	10 - 39	165	164	186*
Yakima	9 - 12	5 - 51	156	171	180*
		LOWER COLUMBIA			
Mill Creek	1	22	78	195	154*
Klickitat	1	13	200+	200+	--
White Salmon	2	27	191	146	174*
Lewis	13 - 17	10 - 27	186	168	182*
Cowlitz	1	8 - 31	130	131	167*
		PUGET SOUND			
White	1	15 - 31	161	155	164*
Green	1 - 3	10 - 25	157	145	130*
Snoqualmie	1	3 - 25	173	166	183*
Skykomish	1 - 2	13 - 25	146	134	145*
Skagit	10 - 11	20 - 39	180	174	172*
Baker	7 - 10	13	180	155	133*
Nooksack	1	3	156	121	--
		OLYMPIC PENINSULA			
Elwha	1	19	200+	124	157*
Dungeness	1	19	185	135	152*

* Records of less than 15 years used on computation of average

RESERVOIR STORAGE - 1000 Acre Feet

BASIN or STREAM	RESERVOIR	USABLE 1/ CAPACITY	Measured (May)			
			1971	1970	1969	Noraml*
		COLUMBIA				
Spokane	Coeur d'Alene Lake	225.1	281.3	149.5	441.8	299.9
Columbia	Franklin D. Roosevelt Lake	5232.0	743.6	538.5	-1864.1	2444.9
Columbia	Banks Lake	761.8	543.1	648.0	581.3	409.7
Okanogan	Conconully Reservoir	13.0	7.4	8.1	6.6	7.6
Okanogan	Salmon Lake	10.5	3.0	7.6	7.6	8.7
Chelan	Lake Chelan	676.1	192.6	74.3	229.1	210.0
		YAKIMA				
Yakima	Keechelus Lake	157.8	98.4	99.3	107.9	120.6
Kachess	Kachess Lake	239.0	166.2	196.2	193.0	202.4
Cle Elum	Lake Cle Elum	436.9	238.0	216.9	323.4	323.2
Bumping	Bumping Lake	33.7	3.8	7.7	7.7	20.1
Tieton	Rimrock Lake	198.0	112.2	119.5	165.6	154.1
		PUGET SOUND				
Skagit	Ross Reservoir	1202.9	775.9	541.0	546.5	695.4
Skagit	Diablo Reservoir	90.6	88.4	86.4	87.0	85.2
Skagit	Gorge Reservoir	9.8	8.5	8.0	8.0	--

1/ Based on Active Storage

* 15-year average 1953-67

SOIL MOISTURE - MAY

Drainage Basin and Station	Number	Elev.	Profile Depth	(Inches): Total : Capacity:	Soil Moisture Content (Inches) as of May 1		
					1971	1970	1969
CRAB CREEK							
Jack Woods	18B3m	2600	48	13.6	10.2	10.4	10.3
Drause	18B4m	2440	48	13.6	9.7	9.2	9.4
Sheffels	18B5m	2360	48	13.6	9.5	8.7	8.3
Sherman	18B7m	2440	48	13.6	8.8	8.9	8.6
Wheatridge	18B6m	2200	48	13.6	10.4	9.6	9.5
OKANOGAN							
Salmon Meadows	19A2M	4500	48	5.4	3.8	3.7	3.7
Trout Creek	3-M	3600	48	7.3	3.8*	--	5.3
YAKIMA							
Domery Flat	21B20m	2200	48	6.9	4.8	5.6	--
Lake Cle Elum	21B14M	2200	48	12.8	9.2	9.2	--
WALLA WALLA							
Couse	17C3m	3650	48	11.1	10.0	10.4	10.9
Helmers	17C2M	4400	48	12.0	10.2	10.5	11.2
WENATCHEE							
Upper Wheeler	20B7M	4400	48	12.7	11.4	6.3	6.5

* April 1 measurement

FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile Depth	(Inches): Total : Capacity:	Soil Moisture Content (Inches) as of Oct. 1		
					1970	1969	1968
CRAB CREEK							
Jack Woods	18B3m	2600	48	13.6	7.0	7.5	7.1
Krause	18B4m	2440	48	13.6	4.4	5.9	5.2
Sheffels	18B5m	2360	48	13.6	4.4	4.5	4.9
Sherman	18B7m	2440	48	13.6	3.8	4.2	3.9
Wheatridge	18B6m	2200	48	13.6	7.8	5.4	4.6
OKANOGAN							
Salmon Meadows	19A2M	4500	48	5.4	1.7	2.7	2.7
Trout Creek	3-M	3600	48	7.3	3.4*	3.8*	4.1
YAKIMA							
Domery Flat	21B20m	2200	48	6.9	2.4	--	3.1
Lake Cle Elum	21B14M	2200	48	12.8	7.6	--	5.2
WALLA WALLA							
Couse	17C3m	3650	48	11.1	5.9	6.1	7.4
Helmers	17C2M	4400	48	12.0	7.3	7.1	7.6
WENATCHEE							
Upper Wheeler	20B7M	4400	48	12.7	5.1	9.8	5.5

* Nov. 1 measurement

PRECIPITATION [1]

Division Averages and Departures

DRAINAGE DIVISIONS	FALL Sept-Oct 1970 [2] Observed	Departure	WINTER Nov. '70 - Mar. '71 [2] Observed	Departure	SPRING April '71 [2] Observed	Departure
Columbia in Canada	3.64	-0.25	15.63	+2.94	1.30	-0.08
Pend Oreille - Spokane	4.30	+0.42	19.87	+1.62	2.35	+0.02
Northeastern Washington	3.16	+0.91	11.07	-0.02	1.83	+0.40
Southeastern Washington	3.59	+0.94	12.11	-0.30	1.55	-0.33
Central Washington	3.05	-1.39	33.80	+6.67	1.22	-0.99
North Central Washington	1.36	-0.05	8.22	+1.88	0.68	-0.09
Northwest Slope Cascades	12.29	+0.62	63.74	+11.60	3.78	-2.13
Southwest Slope Cascades	7.74	+0.02	52.21	+11.34	3.07	-1.26

Northeastern Washington - Lower Spokane, Colville, Sanpoil and lower Kettle drainages.

Southeastern Washington - Touchet, Tucannon and Palouse drainages.

Central Washington - Yakima, Wenatchee and Chelan drainages.

North Central Washington - Methow and Okanogan drainages.

Northwest Slope Cascades - Puget Sound drainages.

Southwest Slope Cascades - Lower Columbia drainages.

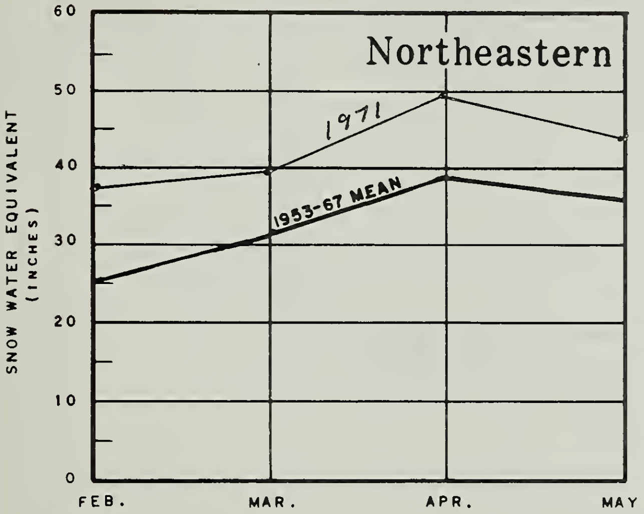
1/ - Preliminary analysis by U. S. Weather Bureau from data furnished by Meteorological Services of Canada and U. S. Weather Bureau.

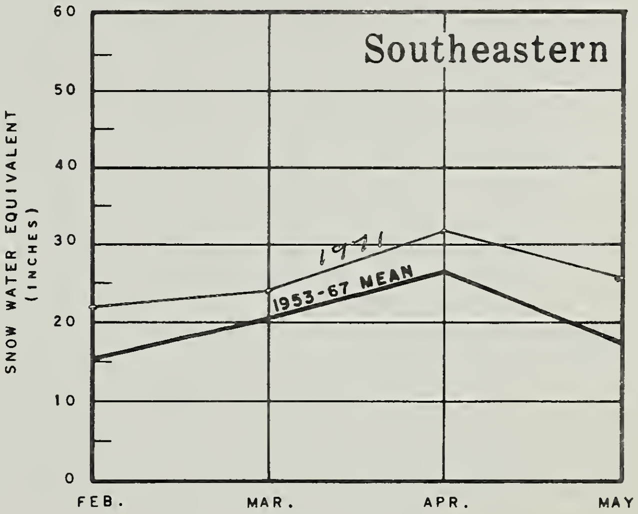
2/ - Departure from 15-year (1953-67) drainage division average.

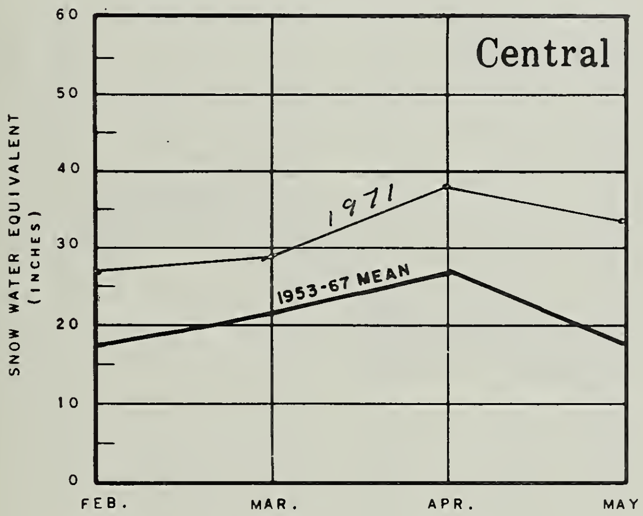
WASHINGTON SNOW COVER

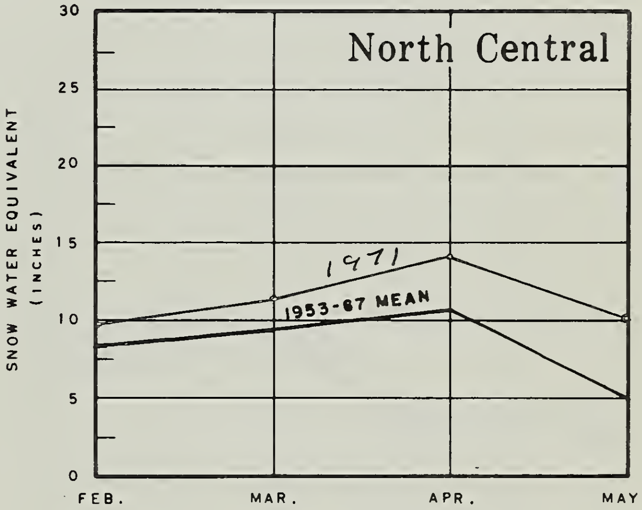
1971

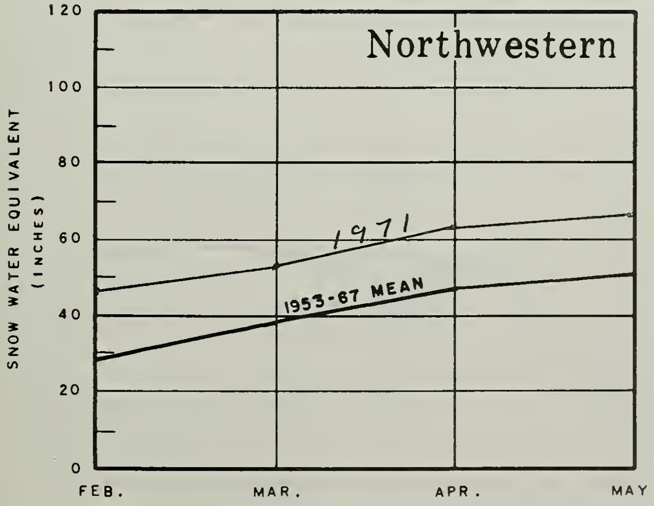
DRAINAGE AREAS

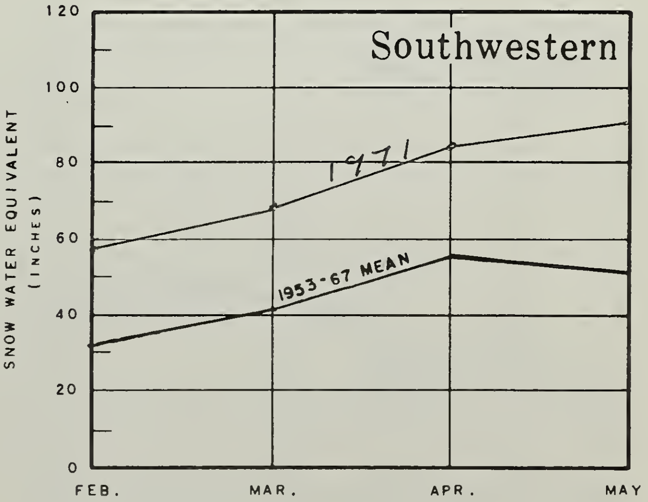










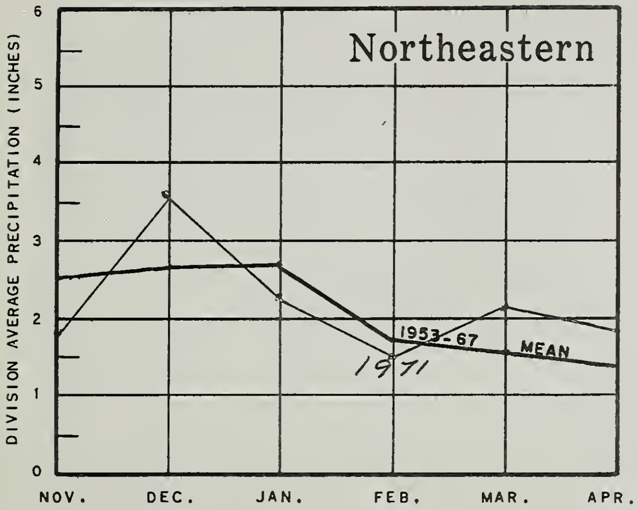


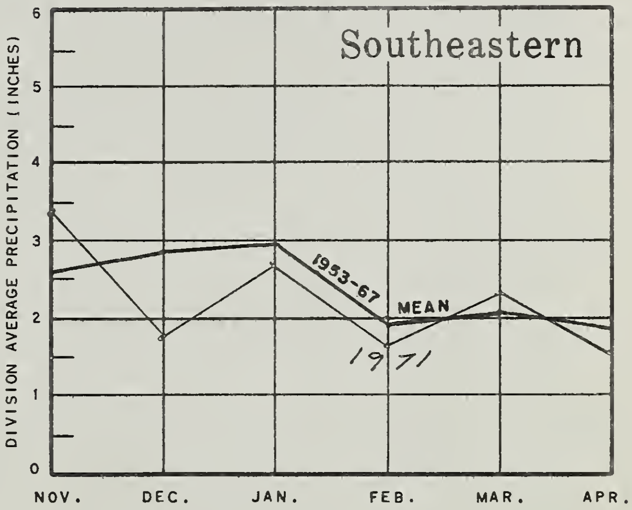
Selected Snow Survey Courses by Soil Conservation Service

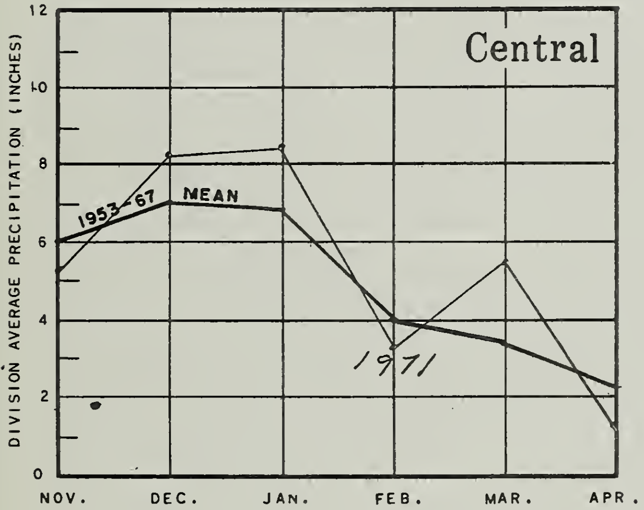
WASHINGTON VALLEY PRECIPITATION

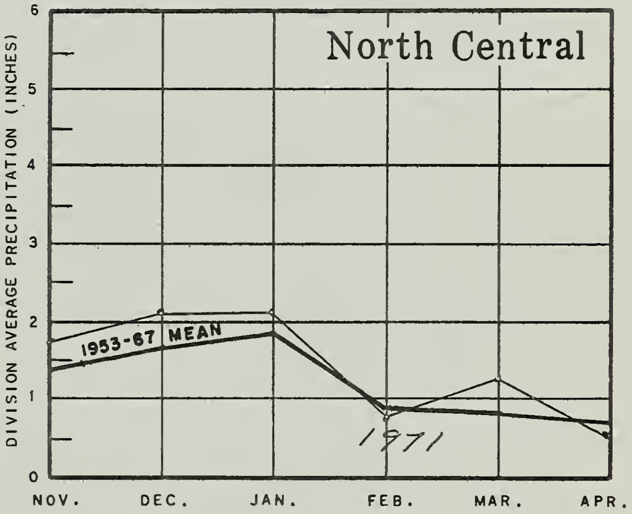
1970-1971

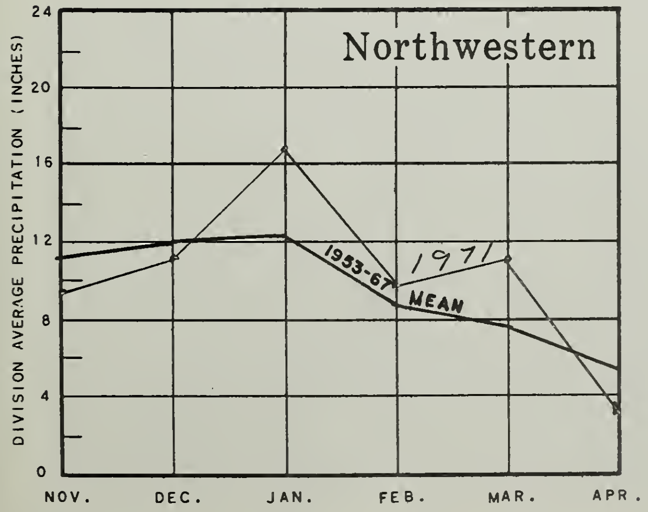
DRAINAGE AREAS

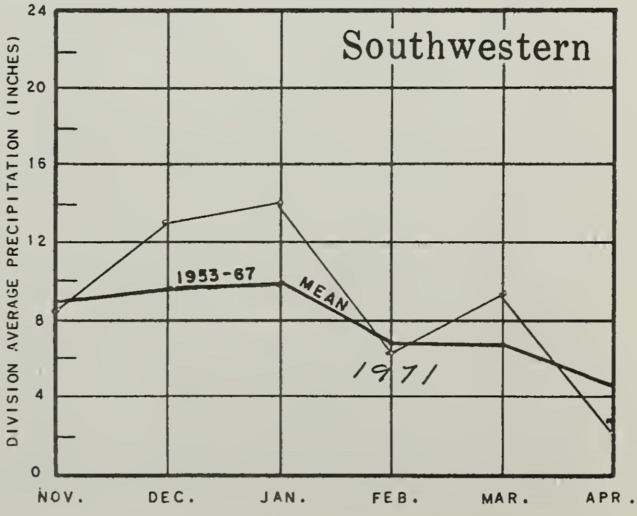












Preliminary Analysis by U. S. Weather Bureau

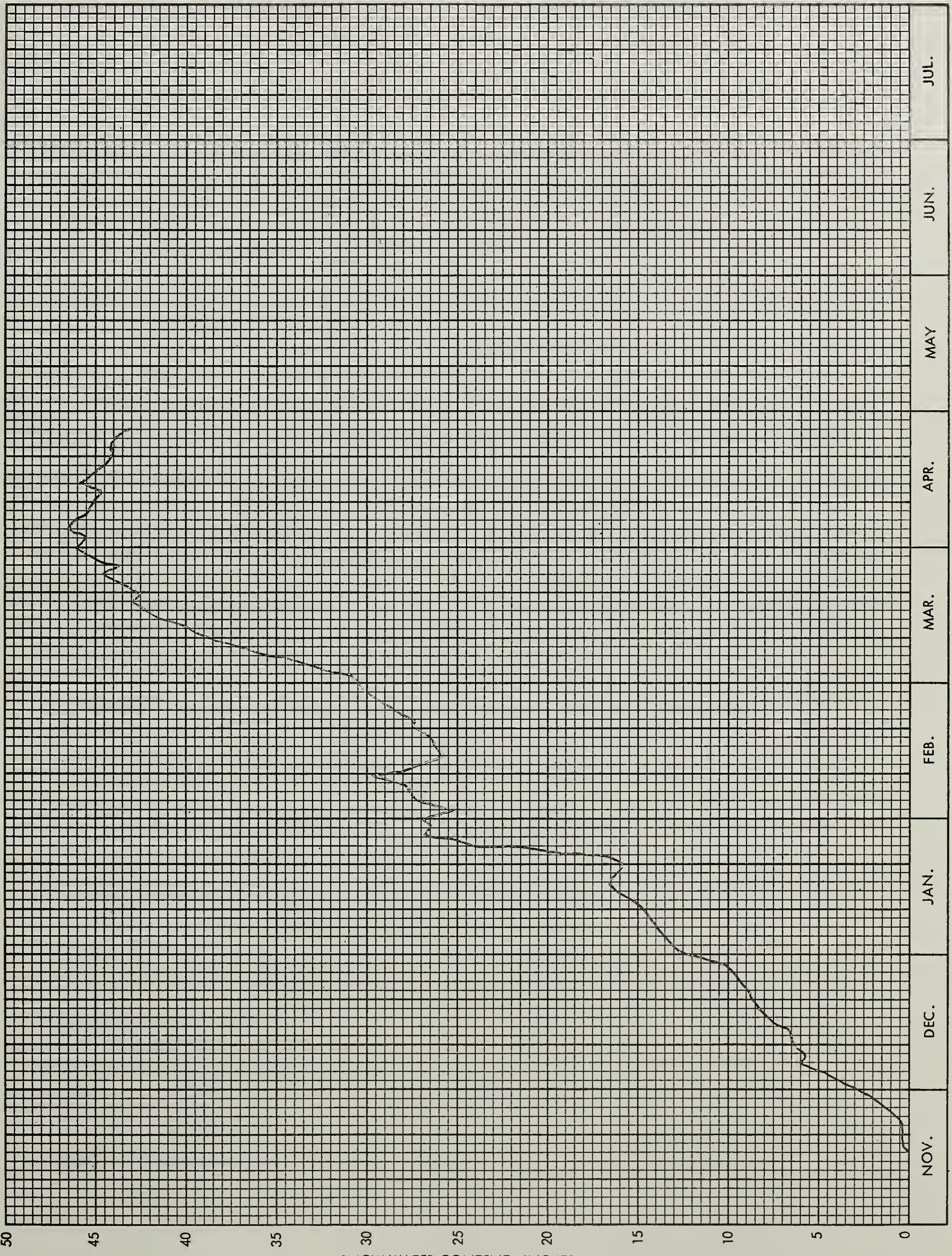
1970 - 71

SNOW PILLOW DATA

Cougar Mountain - FS

Sec. 21 T. 21N R. 9E No. 21B42SP Drainage: Green River

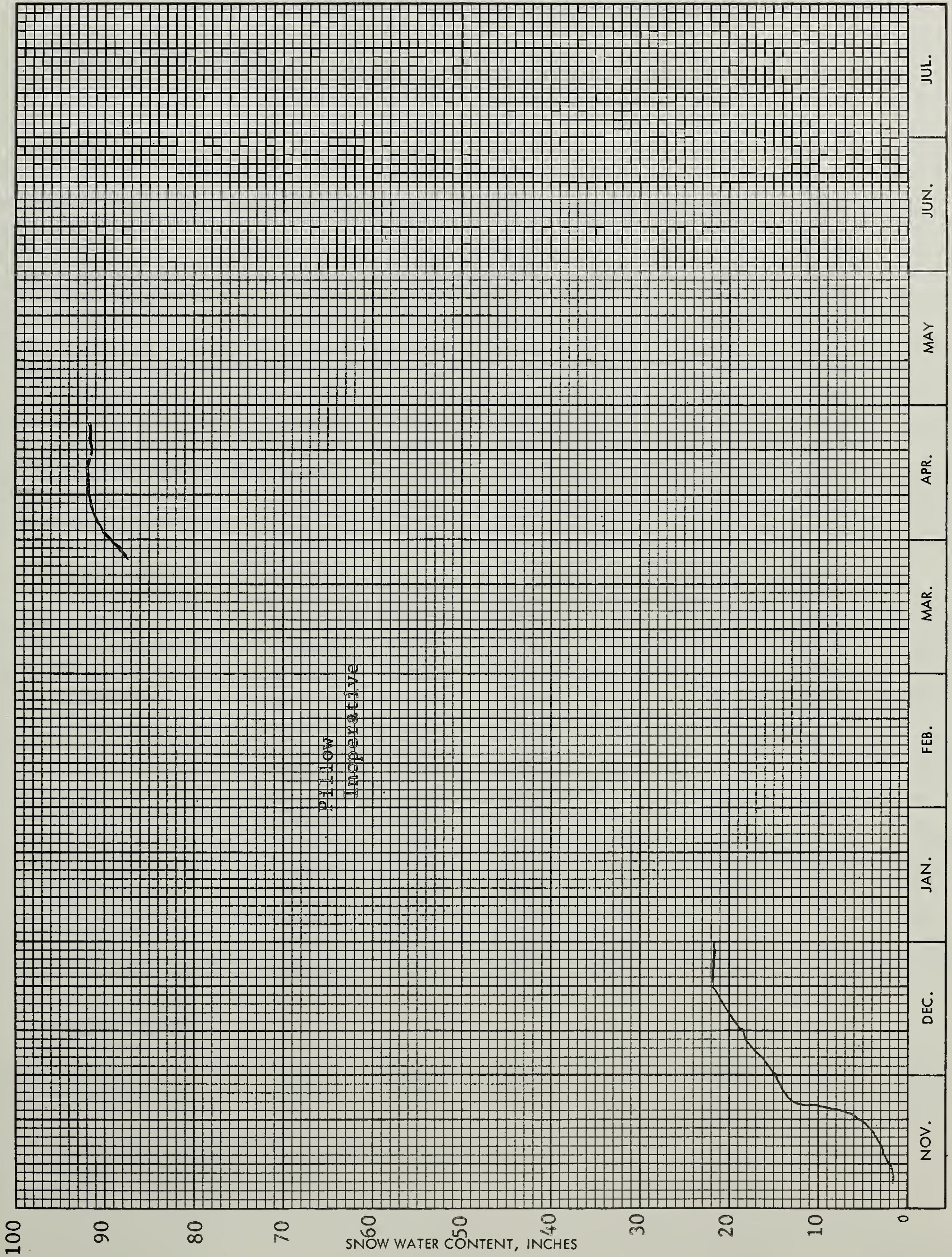
Lat. 47° 17' Long. 121° 40' Elev. 3200'



1970 - 71
SNOW PILLOW DATA
Snowshoe Butte - FS

Sec. 14 T. 20N R. 11E No. 21B43SP Drainage: Green River

Lat. 47° 13' Long. 121° 22' Elev. 4800'



WSFB-X4-N

APPENDIX 1

SNOW DATA APRIL 1 to MAY 1, 1971

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
						Water Content (inches)	
NAME	No.	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average ++
UPPER COLUMBIA DRAINAGE							
PEND OREILLE RIVER							
Baree Creek	15B11	5500	4/30	129	59.4	49.2	48.4
Baree Midway	15B16	4600	4/30	81	38.5	41.1	--
Baree Trail	15B15	3800	4/30	0	0.0	8.7	1.0*
Benton Meadow	16A2	2344	Not Measured			0.0	0.0
Benton Spring	16A3	4900	4/29	40	16.7	20.6	17.1
Boyer Mountain	17A2	5250	4/28	66	30.4	26.8	25.2
Brush Creek	14A4	5000	4/27	31	10.0	13.2	10.8
Bunchgrass Meadow	17A1	5000	4/28	65	29.1	28.5	30.4
Heart Lake Trail	14C10	4800	4/27	65	29.5	24.3	17.2*
Hoodo Basin	15C10	6000	4/27	146	68.8	56.5	--
Hoodo Creek	15C1	6200	4/27	143	66.1	53.2	52.0
Lookout	15B2	5250	4/15	118	48.7	39.9	--
			4/30	104	44.5	42.4	36.7
Nelson	Canada	3050	4/30	27	11.6	8.0	6.1**
Schweitzer Bowl	16A6	4500	4/28	71	34.0	29.3	--
Schweitzer Ridge	16A5	6100	4/28	128	58.5	43.3	--
Smith Creek	16A1	4800	4/26	127	54.9	37.9	49.4
Winchester Creek	17A3	2970	4/28	15	6.9	5.0	0.5*
KETTLE RIVER							
Barnes Creek	Canada	5500	4/28	52	23.7	17.4	20.8**
Big White Mountain	Canada	5500	4/30	63	25.6	17.8	20.3**
Boulder Road	18A2	1450	4/26	0	0.0	0.0	--
Butte Creek	18A3	4070	4/26	22	8.3	8.0	5.5*
Cabin Creek	18A8	3170	4/26	14	6.3	3.5	--
Carmi	Canada	4100	4/30	6	1.9	2.8	1.3**
Farron	Canada	4000	4/30	33	12.7	9.7	9.6**
Goat Creek	18A4	3595	4/26	0	0.0	0.0	--
Lower Trapping Creek	Canada	3050	4/30	0	0.0	0.0	--
#Monashee Pass	Canada	4500	4/28	35	14.2	10.3	13.7**
Old Glory Mountain	Canada	7000	5/1	82	37.1	27.6	29.4**
Snow Caps Creek	18A5	2150	4/26	0	0.0	0.0	--
Snow Caps Trail	18A6	2720	4/26	0	0.0	0.0	--
Summit G. S.	18A7	4600	4/26	22	7.9	8.4	6.3*
Upper Trapping Creek	Canada	5500	4/30	19	5.8	6.7	5.8**
SPOKANE RIVER							
Copper Ridge	16B2	4800	4/29	57	26.2	31.2	27.8
Forty-nine Meadows	15B3	5000	4/26	95	45.8	34.2	31.4*

\# Not located directly on this drainage
* Adjusted 1953-67 average
** Average for years of record

USDA-SCS-PORTLAND, OREG. 1970

++1953-1967 period

APPENDIX 2

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
						Water Content (inches)	
NAME	No.	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average++
SPOKANE RIVER (Cont.)							
Fourth of July Summit	16B3	3100	4/30	0	0.0	0.0	--
Granite Peak	15B13A	6000	4/26	144	63.8	47.4	--
#Lookout	15B2	5250	4/15	118	48.7	39.9	--
			4/30	104	44.5	42.4	36.7
Lost Lake	15B14A	6000	4/26	177	82.0	58.0	62.7*
Lower Sands Creek	16B1	3400	4/29	49	20.6	19.9	14.6
Medicine Ridge	15B4A	6150	4/26	147	63.0	45.8	--
Outlaw Creek	15B12A	3750	4/26	0	0.0	--	--
Sherwin	16C1	3200	5/1	20	8.2	9.4	--
OKANOGAN RIVER							
Aberdeen Lake	Canada	4300	5/3	0	0.0	3.7	1.6**
Blackwall Peak	Canada	6260	4/30	112	54.2	32.9	36.2**
Bouleau Creek	Canada	5000	4/29	32	11.4	9.9	8.1**
Brenda Mine	Canada	4800	4/28	26	11.1	8.6	--
Brookmere	Canada	3200	4/25	36	13.8	6.4	5.5**
Carrs Landing Lower	Canada	2250	4/27	0	0.0	0.0	--
Carrs Landing Upper	Canada	3200	4/27	0	0.0	0.0	--
Clark +	19A8a	7000	4/30	69	28.3	--	--
Enderby	Canada	6250	4/26	121	50.0	40.9	41.8**
#Freezeout Meadows	20A2	5000	4/27	129	61.1	29.4	31.6
Hamilton Hill	Canada	4900	5/1	42	17.7	14.5	11.4**
#Harts Pass	20A5A	6500	4/26	143	65.8	41.7	49.8
Isintok Lake	Canada	5510	5/1	24	7.7	5.6	6.0**
Lost Horse Mountain	Canada	6300	4/30	42	14.5	10.0	9.6**
#Loup Loup	19A7	4650	4/28	26	10.4	--	--
Lower Esperon Creek	Canada	4270	4/25	43	15.0	--	--
McCulloch	Canada	4200	4/29	8	2.7	4.6	2.8**
Middle Esperon Creek	Canada	4580	4/25	50	21.7	--	--
Missezula Mountain	Canada	5100	Late Report			--	4.5**
Mission Creek	Canada	6000	4/28	64	24.4	18.3	21.4**
Monashee Pass	Canada	4500	4/28	35	14.2	10.3	13.7**
Mount Kobau	Canada	5950	4/30	46	17.4	12.6	13.4**
Muckamuck +	19A9a	6390	4/30	56	23.0	--	--
Mutton Creek No. 1	19A1	5700	4/28	42	17.1	13.9	10.0
Mutton Creek No. 2	19A4	6000	4/28	52	20.7	15.4	15.1
New Copper Mountain	Canada	4300	4/30	4	1.9	--	--
Nickel Plate Mountain	Canada	6200	4/27	34	10.1	7.5	8.3**
Postill Lake	Canada	4500	4/29	24	8.2	7.9	6.7**
Rusty Creek	19A3	4000	4/28	0	0.0	0.0	1.3*
Salmon Meadows	19A2	4500	4/28	26	10.0	8.8	5.0
Silver Star Mountain	Canada	6050	5/2	73	33.5	24.5	27.0**

\# Not located directly on this drainage

* Adjusted 1953-67 average

** Average for years of record

\+ Snow water equivalent estimated from aerial stadia observation

++ 1953-1967 period

APPENDIX 3

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD Water Content (inches)	
NAME	No.	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average ++
OKANOGAN RIVER (Cont.)							
Starvation Mountain	19A10a	6750	4/30	66	27.1	--	--
Summerland Reservoir	Canada	4200	5/2	22	8.6	5.3	6.1**
Trout Creek	Canada	4700	4/26	24	7.2	6.2	4.8**
Upper Esperon Creek	Canada	5290	4/25	59	25.0	--	--
White Rocks Mountain	Canada	6000	4/28	67	30.6	--	--
METHOW RIVER							
Harts Pass	20A5A	6500	4/26	143	65.8	41.7	49.8
Loup Loup	19A7	4650	4/28	26	10.4	--	--
#Mutton Creek No. 1	19A1	5700	4/28	42	17.1	13.9	10.0
#Mutton Creek No. 2	19A4	6000	4/28	52	20.7	15.4	15.1
#Rusty Creek	19A3	4000	4/28	0	0.0	0.0	1.3*
#Salmon Meadows	19A2	4500	4/28	26	10.0	8.8	5.0
CHELAN LAKE BASIN							
Rainy Pass	20A9	4780	4/26	126	58.4	36.4	43.9
Safety Harbor	20A30A	6300	4/27	100	39.5	22.9	--
ENTIAT RIVER							
Brief	20B19	1600	4/27	0	0.0	0.0	0.0*
Entiat Meadows +	20A33a	4800	4/13	162	64.8	--	--
			4/28	122	55.5	26.6	--
Entiat River Trail +	20A34a	3150	4/13	72	31.0	--	--
			4/28	46	22.3	7.4	--
Fox Camp +	20A36a	6510	4/13	182	72.8	--	--
			4/28	182	82.8	47.4	--
Pope Ridge	20B20	4300	4/14	62	26.4	11.0	--
			4/30	38	18.5	9.4	--
Pugh Ridge +	20A32a	6400	4/13	121	48.4	--	--
			4/28	106	48.2	30.0	--
Shady Pass	20A37	5000	4/29	83	37.4	22.8	--
Snow Brushy +	20A35a	3850	4/13	135	54.0	--	--
			4/28	103	46.9	22.6	--
Tommy Creek +	20B21a	5300	4/13	85	34.0	--	--
			4/28	68	31.0	25.9	--
WENATCHEE RIVER							
Berne-Mill Creek	21B23	2925	4/29	82	41.7	25.5	18.2*
Berne-Mill Creek New	21B41SP	3240	4/29	67	34.2	23.0	--

\# Not located directly on this drainage
* Adjusted 1953-67 average
** Average for years of record
\+ Snow water equivalent estimated from aerial stadia observation

++ 1953-1967 period

APPENDIX 4

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
						Water Content (inches)	
NAME	No.	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average++
WENATCHEE RIVER (Cont.)							
Blewett Pass No. 2	20B2	4270	4/13	48	22.5	17.5	12.1*
			4/29	38	19.7	17.1	8.9*
Chiwaukum G. S.	20B16	1810	4/29	21	8.8	0.0	--
#Fish Lake	21B4	3371	4/26	102	55.1	27.4	24.1
Lake Wenatchee	20B5	1970	4/29	21	9.8	0.0	--
Leavenworth R. S.	20B17	1127	4/27	0	0.0	0.0	--
Merritt	20B18	2140	4/29	31	15.2	3.8	--
Stevens Pass	21B1	4070	4/15	165	74.2	50.1	55.7*
			4/29	152	77.8	55.5	53.5
Stevens Pass Sand Shed	21B45	3700	4/15	115	53.0	32.6	--
			4/29	105	54.9	36.0	--
SQUILCHUCK CREEK							
Beehive Springs	20B3	4400	4/26	11	4.8	6.7	--
Scout-A-Vista	20B4	3400	4/26	5	2.0	0.0	--
STEMILT CREEK							
Jump-Off	20B8	4450	4/27	18	7.4	7.8	--
Stemilt Slide	20B6	5000	4/27	33	15.3	12.4	4.0*
Upper Wheeler	20B7	4400	4/27	9	3.7	4.4	--
COLOCKUM CREEK							
Colockum Creek Upper	20B22	5300	4/28	34	16.0	17.5	--
Colockum Creek Lower	20B23	4300	4/28	17	7.0	8.2	--
YAKIMA RIVER							
#Ahtanum R. S.	21C11	3100	4/26	0	0.0	--	0.0*
Big Boulder Creek	21B9	3200	4/26	56	26.4	14.6	5.0*
#Blewett Pass No. 2	20B2	4270	4/13	48	22.5	17.5	12.1*
			4/29	38	19.7	17.1	8.9
Bumping Lake	21C8	3450	4/16	62	28.2	--	13.3*
			5/3	42	20.9	19.2	9.3
Bumping Lake New	21C36	3400	4/16	74	33.8	--	--
			5/3	54	27.0	19.6	--
Fish Lake	21B4	3371	4/26	102	55.1	27.4	24.1*
Lake Cle Elum	21B14M	2200	4/14	0	0.0	--	--

Not located directly on this drainage
* Adjusted 1953-67 average

++ 1953-1967 period

APPENDIX 5

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
NAME	No.	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches) Last Year	Water Content (inches) Average++
YAKIMA RIVER (Cont.)							
Joe Lake +	21B46a	4624	Marker down				
Lemah Creek +	21B47a	3327	4/26	123	57.8	35.6	--
Morse Lake	21C17	5400	4/29	207	102.6	63.8	62.4*
#Olallie Meadows	21B2	3625	4/13	181	80.0	44.1	51.0*
			4/26	167	88.0	51.0	48.1*
#Satus Pass	20D1	4030	4/29	30	13.0	0.0	--
#Stampede Pass	21B10	3000	4/15	168	70.6	36.6	48.6
			5/3	130	59.8	45.5	46.0
Tunnel Avenue	21B8	2450	4/14	85	35.3	--	--
			4/28	70	32.3	17.2	17.4
Waptus Lake +	21B49a	3024	4/26	126	59.2	34.3	--
White Pass (E. Side)	21C28	4500	4/14	94	41.6	--	27.8*
			4/30	85	40.1	29.1	26.2*
White Pass (L. Lake)	21C27	4500	4/14	102	47.2	--	--
			Not Measured			35.8	28.0*
Van Epps Pass +	20B26a	5925	4/26	171	80.4	New Marker	
AHTANUM CREEK							
Ahtanum R. S.	21C11	3100	4/26	0	0.0	--	0.0*

LOWER COLUMBIA DRAINAGE

NAME	No.	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average++
ASOTIN CREEK							
Spruce Springs	17C4	5700	4/28	58	26.5	29.5	--
MILL CREEK							
Tollgate	18D3M	5070	4/27	56	26.9	34.3	17.5
KLICKITAT RIVER							
Satus Pass	20D1	4030	4/29	30	13.0	0.0	--
WHITE SALMON RIVER							
Cultus Creek	21C12	4000	4/29	162	78.6	43.2	47.8*
#Surprise Lakes	21C13A	4250	4/29	180	92.7	45.1	50.5
WIND RIVER							
Old Man Pass	21D19	3100	4/28	85	42.0	2.9	11.4

\# Not located directly on this drainage
\+ Snow water equivalent estimated from aerial stadia observation
* Adjusted 1953-67 average

USDA-SCS-PORTLAND, OREG. 1970

++ 1953-1967 period

APPENDIX 6

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
						Water Content (inches)	
NAME	No.	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average ++
LEWIS RIVER							
Blue Lake +	21C22a	4800	4/29	282	141.0	86.4	90.1*
Bob's Trail	21C21	2200	4/28	56	26.3	0.6	5.7*
Calamity Ridge +	22D1a	2500	4/28	24	10.8	0.4	--
Council Pass +	21C18a	4200	4/29	136	68.0	38.4	35.7*
#Cultus Creek	21C12	4000	4/29	162	78.6	43.2	47.8
Divide Meadow +	21C29a	5600	4/29	189	94.5	62.4	61.6*
Grand Meadow	21C25	3500	4/29	85	42.3	16.6	22.2*
Lone Pine Shelter	21C26	3800	4/26	172	83.4	33.6	45.3*
Marble Mountain +	22C5a	3200	4/26	156	84.2	5.6	--
New Muddy River	22C6	1400	4/28	15	6.7	0.0	--
Old Man Pass	21D19	3100	4/28	85	42.0	2.9	11.4
Plains of Abraham +	22C1a	4400	4/26	246	123.0	94.5	73.8*
Smith Creek Road	22C4	2100	4/28	61	30.7	0.0	--
Spencer Meadow +	21C20a	3400	4/28	92	42.3	3.2	13.0*
Surprise Lakes	21C13A	4250	4/29	180	92.7	45.1	50.5*
Table Mountain +	21C24a	4200	4/29	162	81.0	48.0	44.7*
Timbered Peak +	21D18a	3000	4/28	66	30.8	2.0	12.3*
COWLITZ RIVER							
Pigtail Peak	21C33	5900	4/14	209	103.2	--	--
			Not Measured			67.5	--
#Plains of Abraham +	22C1a	4400	4/26	246	123.0	94.5	73.8*
#White Pass (E. Side)	21C28	4500	4/14	94	41.6	--	27.8*
			4/30	85	40.1	29.1	26.2*
#White Pass (L. Lake)	21C27	4500	4/14	102	47.2	--	--
			Not Measured			35.8	28.0*

PUGET SOUND DRAINAGE

NAME	No.	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average ++
WHITE RIVER							
#Morse Lake	21C17	5400	4/29	207	102.6	63.8	62.4
GREEN RIVER							
Cougar Mountain SP	21B42SP	3200	4/26	68	35.0	18.6	--
Snowshoe Butte SP	21B43SP	5000	4/26	188	91.8	60.0	--
Stampede Pass	21B10	3000	4/15	168	70.6	36.6	48.6
			5/3	130	59.8	45.5	46.0

\# Not located directly on this drainage
\+ Snow water equivalent estimated from aerial stadia observation
* Adjusted 1953-67 average

++ 1953-1967 period

APPENDIX 7

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
						Water Content (inches)	
NAME	No.	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average ++
SNOQUALMIE RIVER							
Olallie Meadows	21B2	3625	4/13	181	80.0	44.1	51.0*
			4/26	167	88.0	51.0	48.1*
SKYKOMISH RIVER							
#Stevens Pass	21B19	4070	4/15	165	74.2	50.1	55.7*
			4/29	152	77.8	55.5	53.5
#Stevens Pass Sand Shed	21B45	3700	4/15	115	53.0	32.6	--
			4/29	105	54.9	36.0	--
SKAGIT RIVER							
Beaver Creek Trail	21A4	2200	4/27	49	24.3	0.0	5.6*
Beaver Pass	21A1	3680	4/27	121	59.9	27.0	35.0
Brown Top +	21A28a	6000	4/27	196	91.0	57.6	--
Devils Park	20A4	5900	4/26	134	60.8	41.5	49.2
Freezeout Cr. Trail	20A1	3500	4/27	51	22.3	10.1	8.3
Freezeout Meadows	20A2	5000	4/27	129	61.1	29.4	31.6
Granite Creek		3500	4/26	58	27.4	New Course	
#Harts Pass	20A5A	6500	4/26	143	65.8	41.7	49.8
Lake Hozomeen	21A2	2600	4/27	45	19.5	4.0	5.8
Meadow Cabins	20A8	1900	4/26	12	6.4	0.0	2.0*
#Rainy Pass	20A9	4780	4/26	126	58.4	36.4	43.9
Thunder Basin	20A7	4200	4/26	85	36.1	23.2	26.9*
BAKER RIVER							
Baker Pass	21A27a	4900	Not Measured			69.3	--
						82.8	--
Dock Butte	21A11A	3800	4/18	250	110.0	49.6	86.4*
			4/28	220	107.2	58.6	87.1*
Easy Pass	21A7A	5200	4/18	236	103.8	68.5	--
			4/29	236	113.7	85.2	107.4*
Jasper Pass	21A6A	5400	4/18	300	132.0	86.5	102.6*
			4/29	268	129.2	81.4	113.6*
Komo Kulshan	21A17	800	4/28	14	6.8	0.0	--
Marten Lake	21A9A	3600	4/18	255	112.2	59.6	92.3*
			4/29	229	111.3	69.5	93.3*
Mount Blum	21A18a	5800	4/18	187	82.3	68.9	--
			4/29	173	83.0	72.9	--
#Panorama New	21A26	4300	4/15	240	105.5	66.2	--
			4/30	220	107.8	69.3	--

\# Not located directly on this drainage
\+ Snow water equivalent estimated from aerial stadia observation
* Adjusted 1953-67 average

USDA-SCS-PORTLAND, OREG. 1970

++ 1953-1967 period

APPENDIX 8

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
						Water Content (inches)	
NAME	No.	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average++
BAKER RIVER (Cont.)							
Rocky Creek	21A12A	2100	4/18	126	55.4	1.5	31.8*
			4/28	114	56.0	7.1	20.4*
Schreibers Meadow	21A10A	3400	4/18	199	95.5	44.5	70.5*
			4/28	191	101.8	55.0	73.7*
S. F. Thunder Creek	21A14A	2200	4/18	23	10.1	0.0	--
			4/28	22	10.3	0.0	--
Sulphur Creek	21A13	1600	4/28	56	27.3	0.0	--
Three Mile Creek	21A8A	4500	4/28	0	0.0	0.0	--
Watson Lakes	21A8A	4500	4/18	250	110.0	--	79.7*
			4/29	222	107.4	60.6	83.6*
NOOKSACK RIVER							
Panorama New	21A26	4300	4/15	240	105.5	66.2	--
			4/30	220	107.8	69.3	--
OLYMPIC PENINSULA							
DUNGENESS RIVER							
Deer Park	23B4	5200	4/26	82	36.9	19.9	24.3*
MORSE CREEK							
Cox Valley	23B14	4500	4/29	146	68.3	38.1	--
ELWHA RIVER							
Hurricane	23B3	4500	4/27	104	44.0	17.9	28.0*

* Adjusted 1953-67 average

++ 1953-1967 period

Agencies Assisting with Snow Surveys

GOVERNMENT AGENCIES

Canada:

Department of Lands, Forests and Water Resources,
Water Resources Service, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

- Department of the Army
  - Corps of Engineers
- U. S. Department of Agriculture
  - Forest Service
- U. S. Department of Commerce
  - Weather Bureau
- U. S. Department of the Interior
  - Bonneville Power Administration
  - Bureau of Reclamation
  - Geological Survey
  - National Park Service

PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company

OTHER PUBLIC AGENCIES

Okanogan Irrigation District
Wenatchee Heights Irrigation District

MUNICIPALITIES

City of Tacoma
City of Seattle

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

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